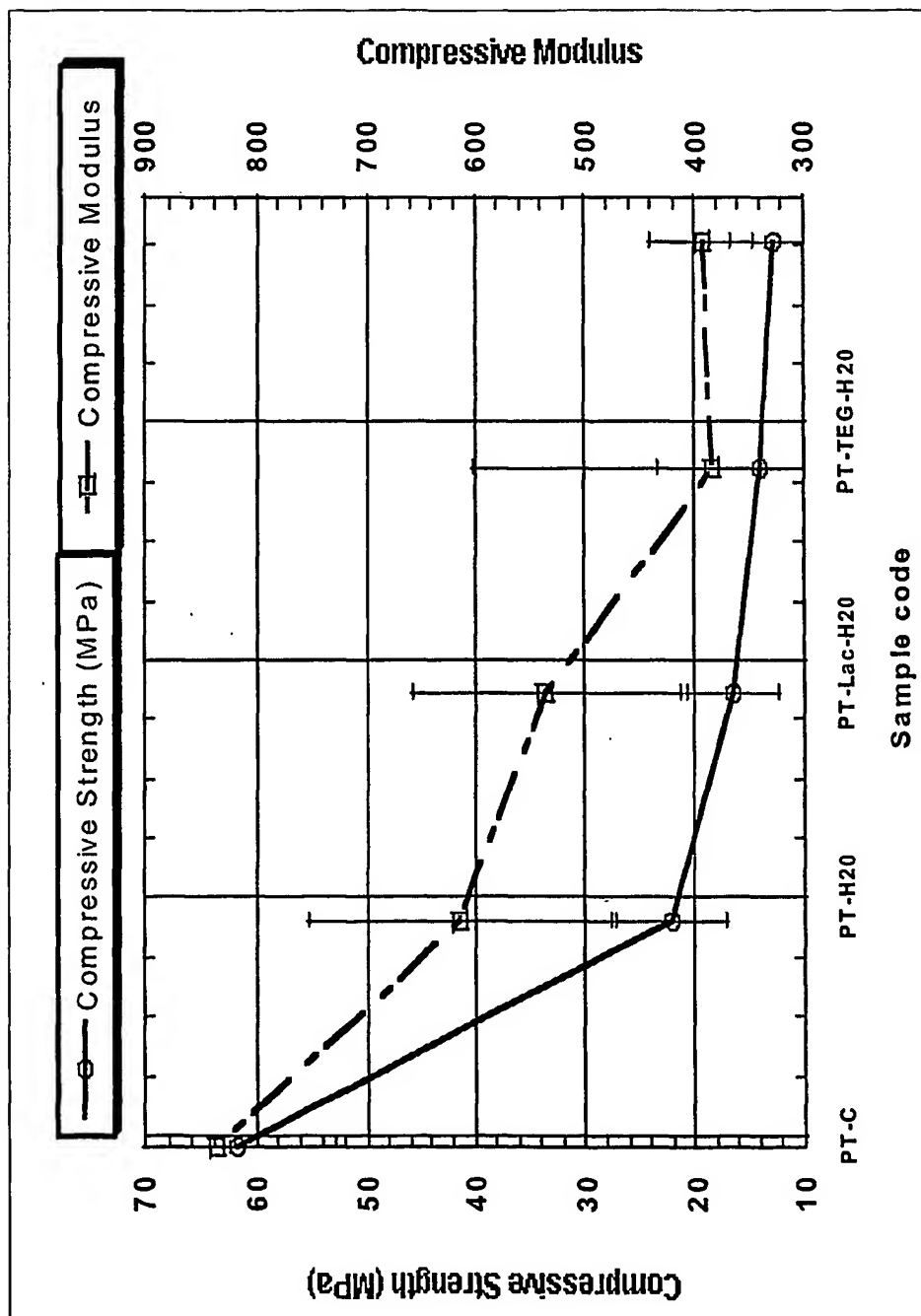


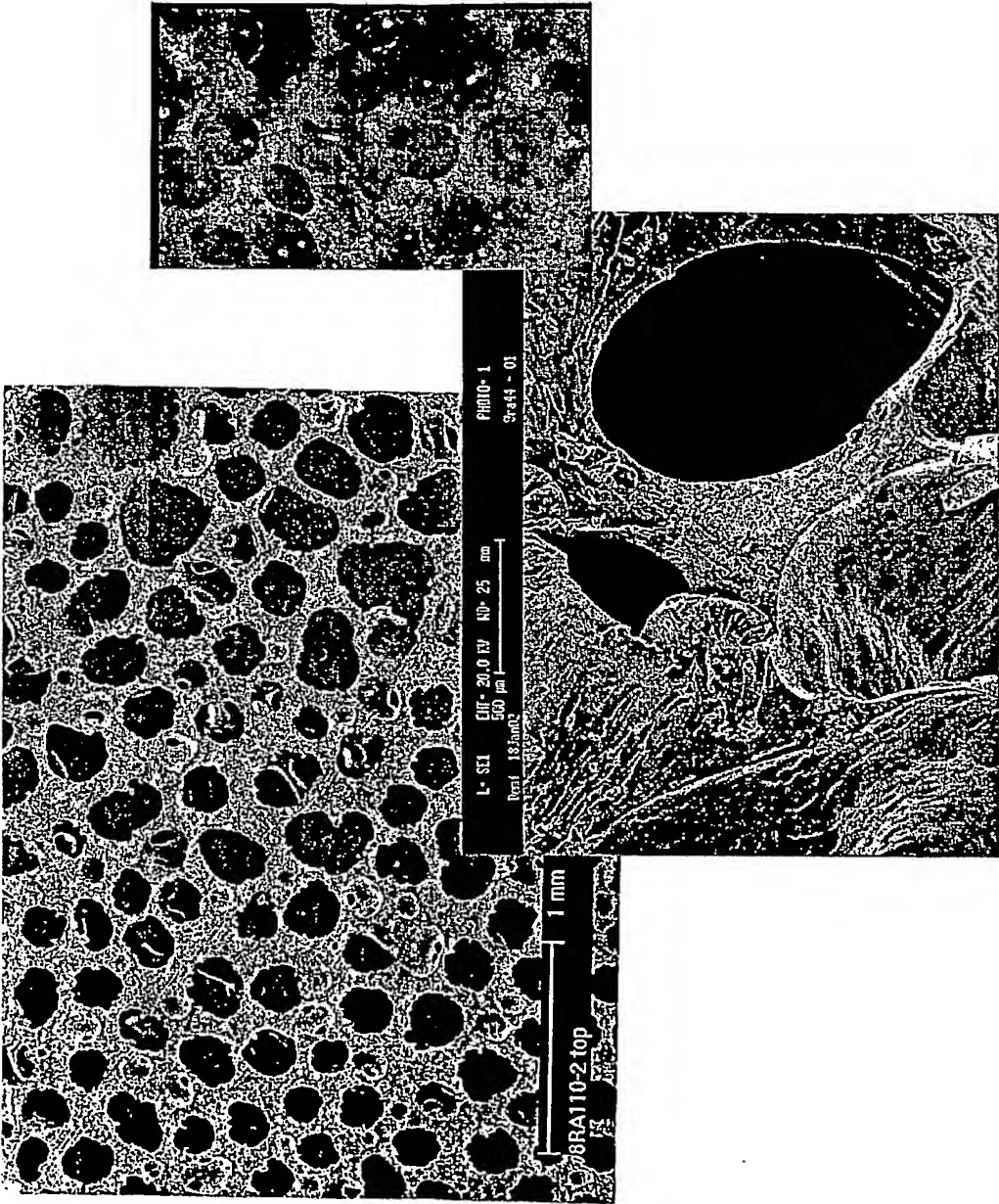
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Figure 1



Effect of water, lactose, and triethylene glycol (TEG) on compressive strength

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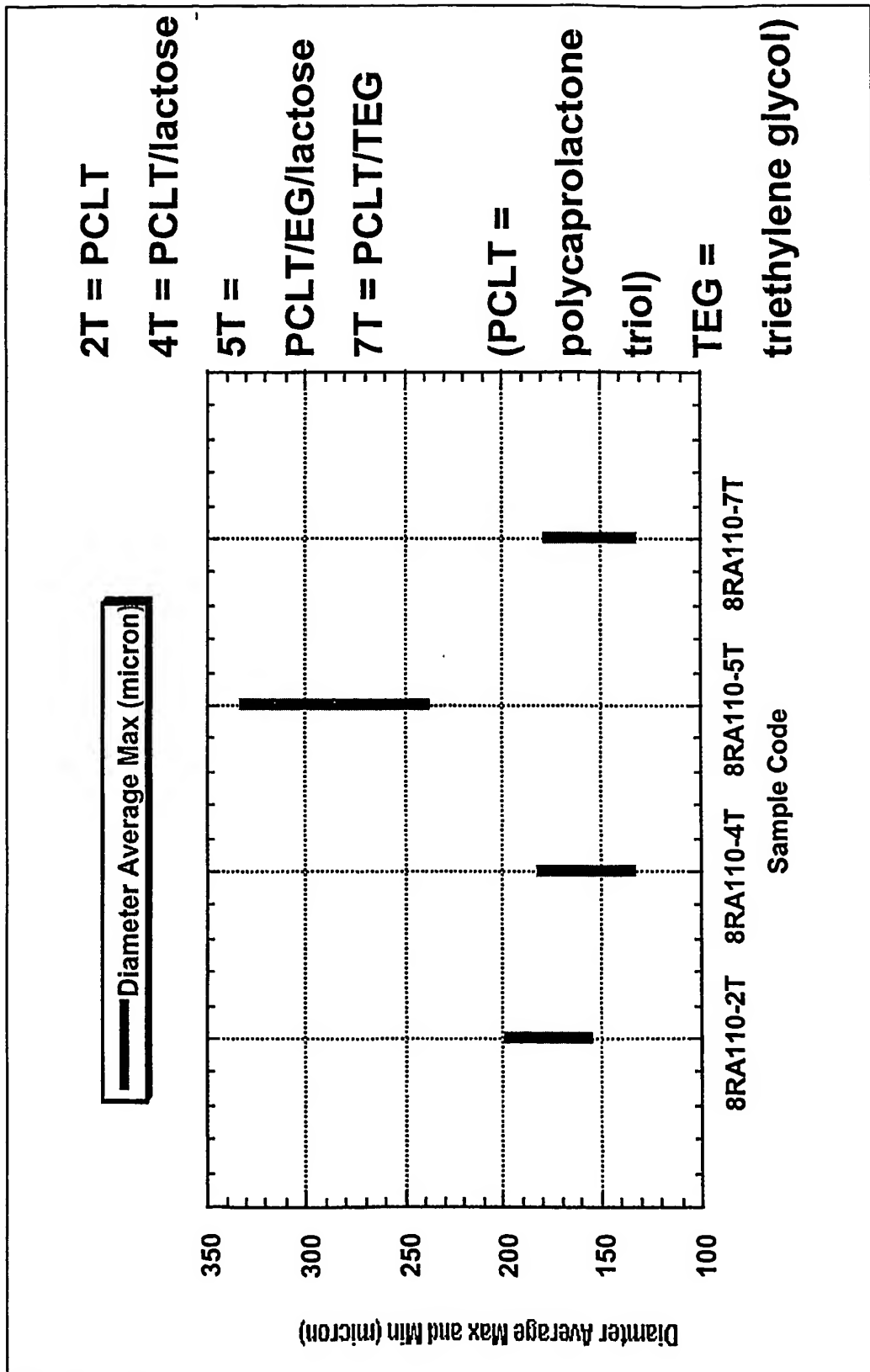


SEM of a porous polymer scaffold

Figure 2

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Figure 3



Effect of different degradable cross-linker structure on average

porosity

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HA + hydroxyapatite
 PSA = poly(sebacic
 anhydride)
 PLGA = poly(glycolic)
 and poly(lactic acid)
 copolymer
 SAP = silica particles

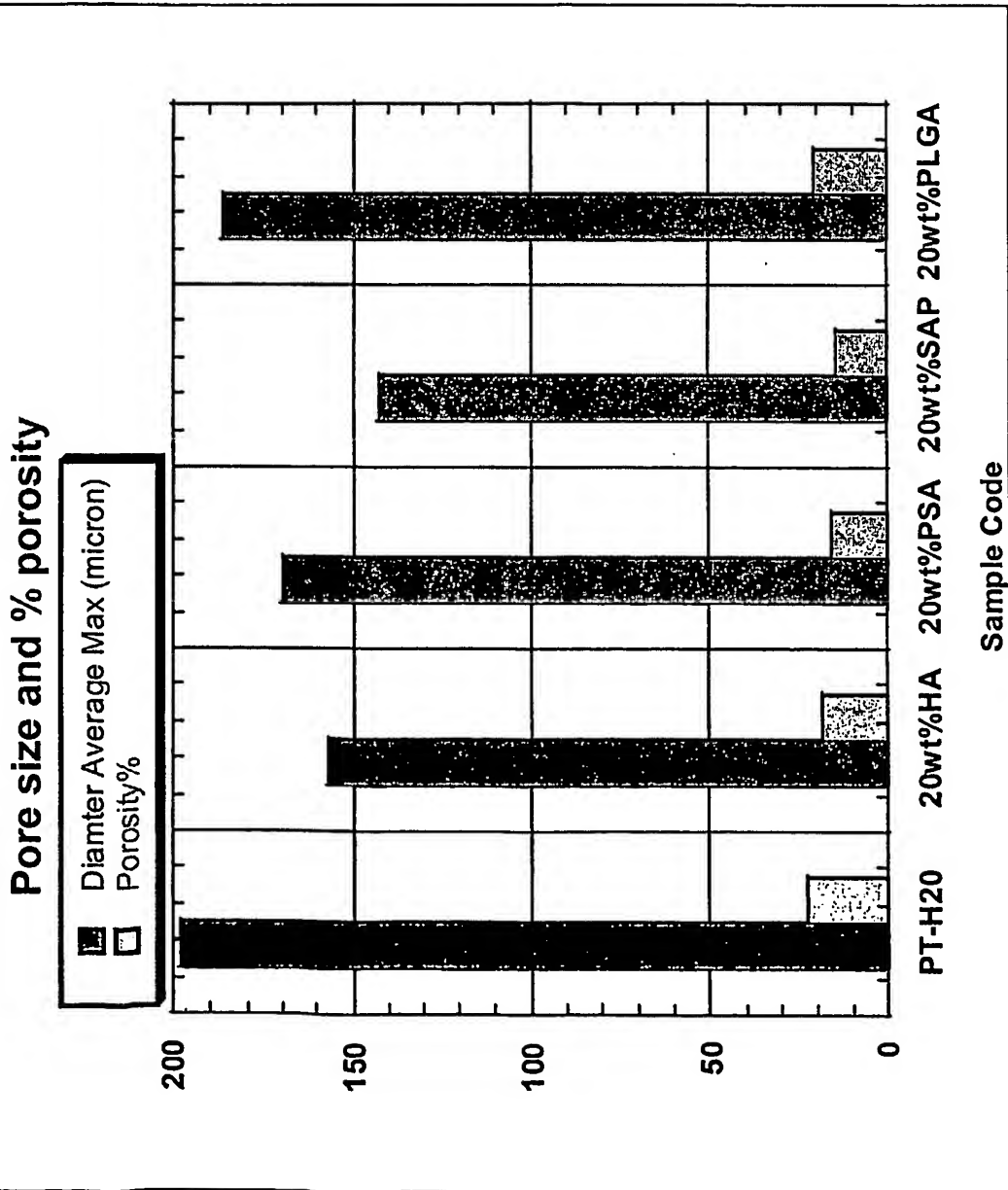
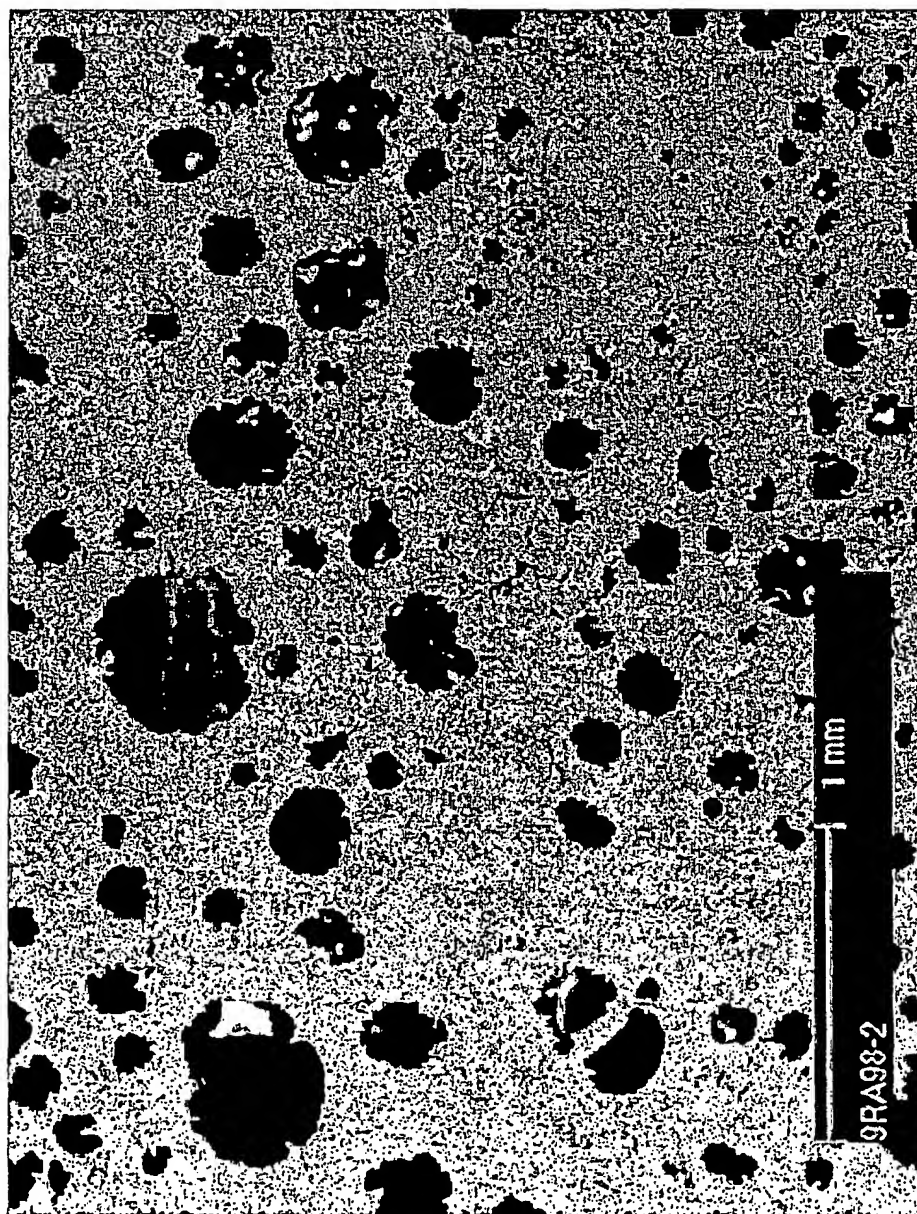


Figure 4

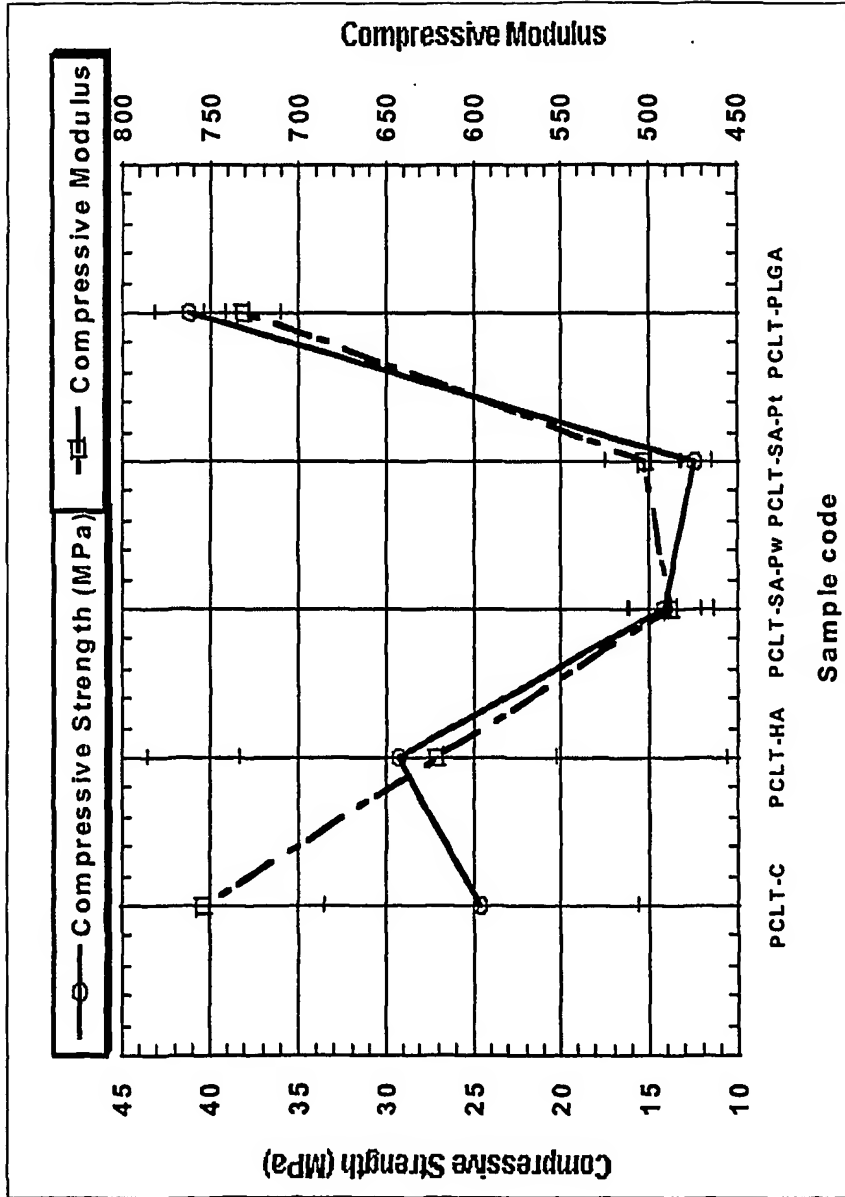
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Figure 5



Incorporation of fillers changes pore structure

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PCLT-C = polycaprolactone triol, PCLT-HA = (hydroxyapatite), PCLT-SA-PW = silica powder, PCLT-SA-Pt = silica powder, PCLT-PLGA = poly(glycolic and lactic acid) copolymer

Figure 6

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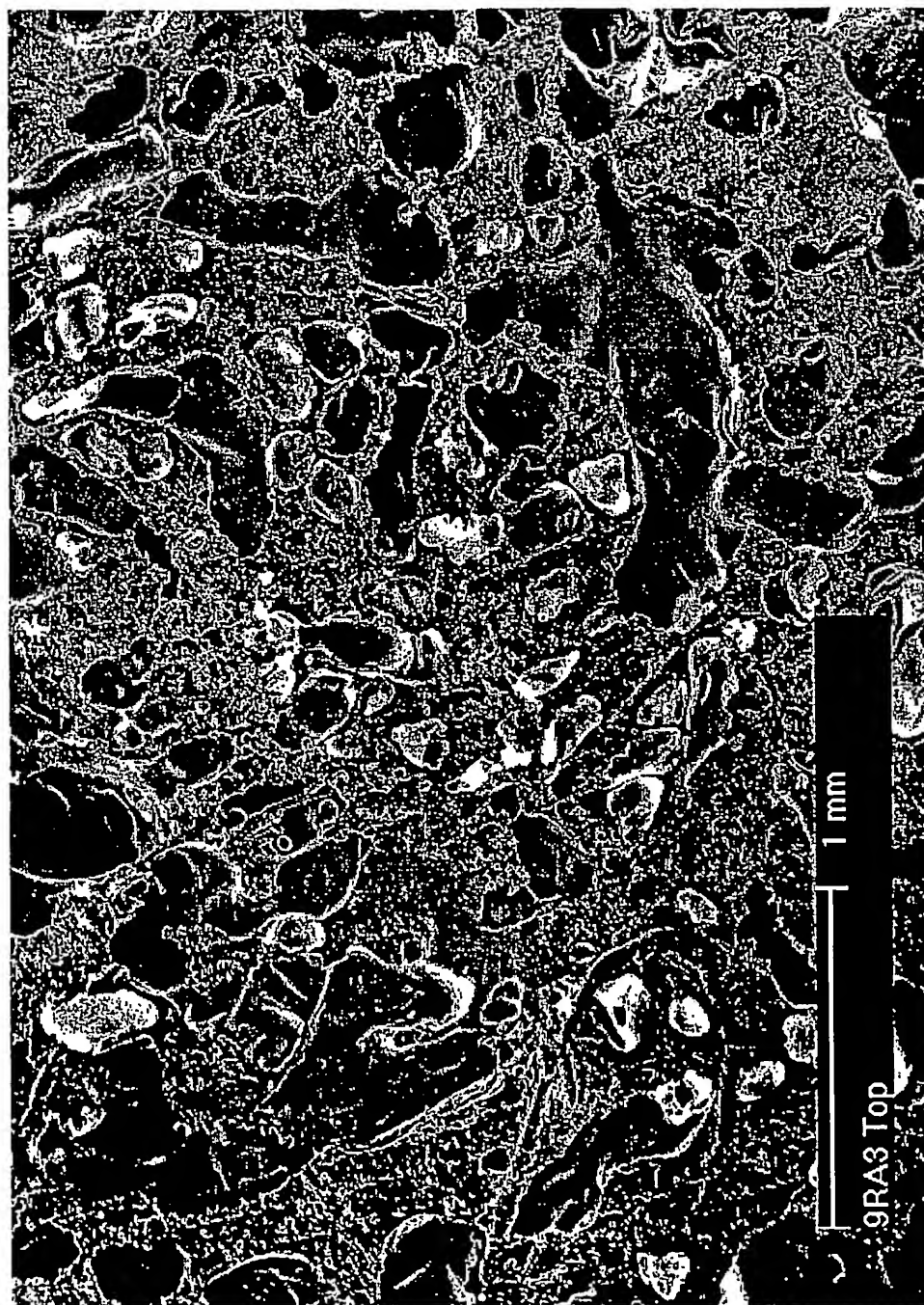


Figure 7

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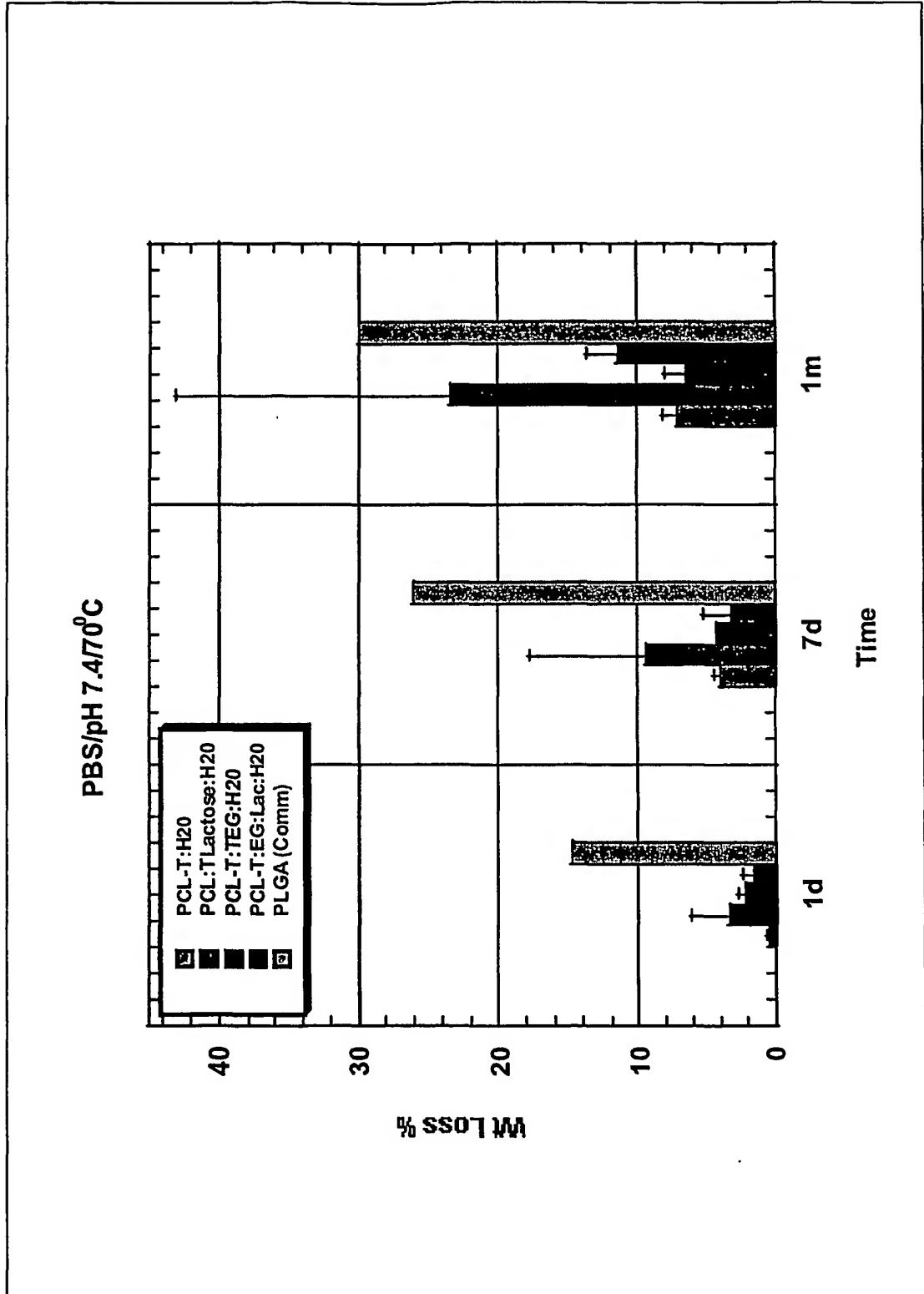
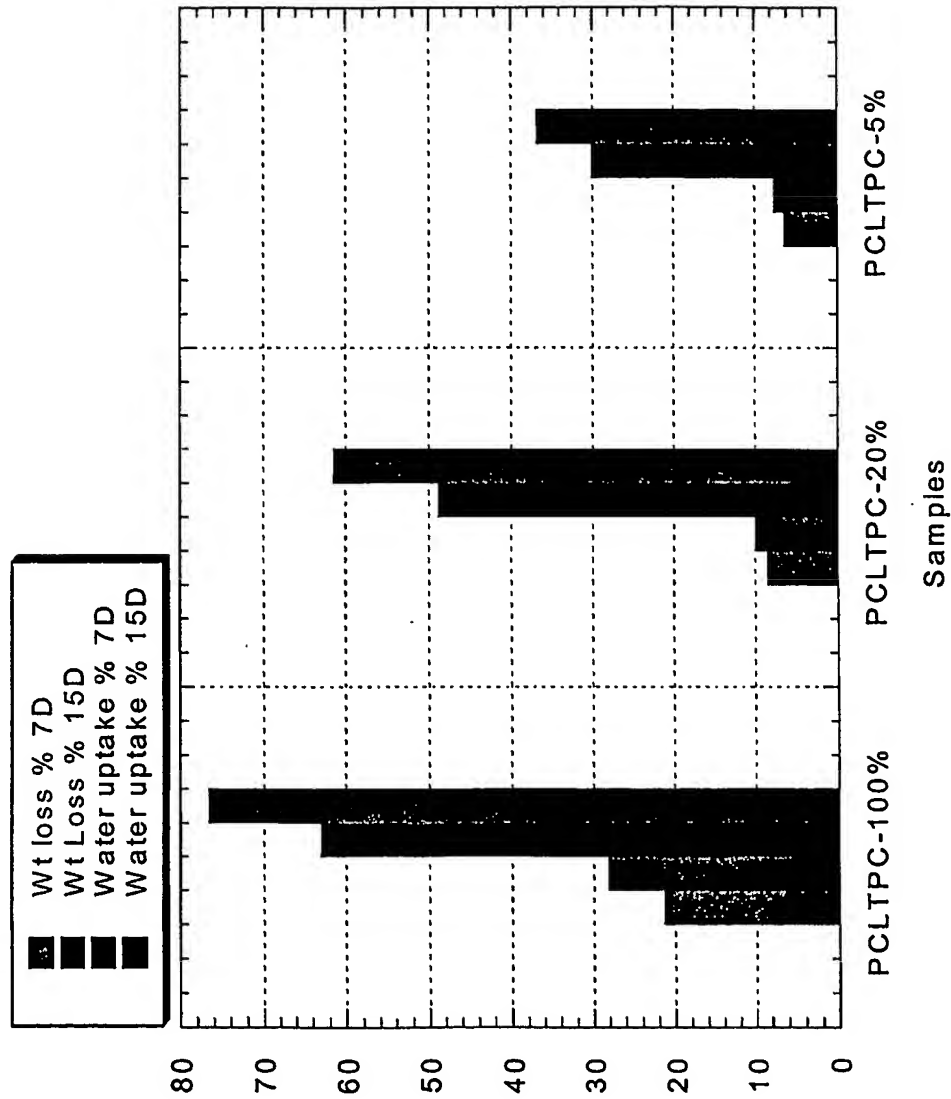


Figure 8

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Figure 9



Effect of incorporating phosphocholine modified polycaprolactone triol on hydrolytic degradation

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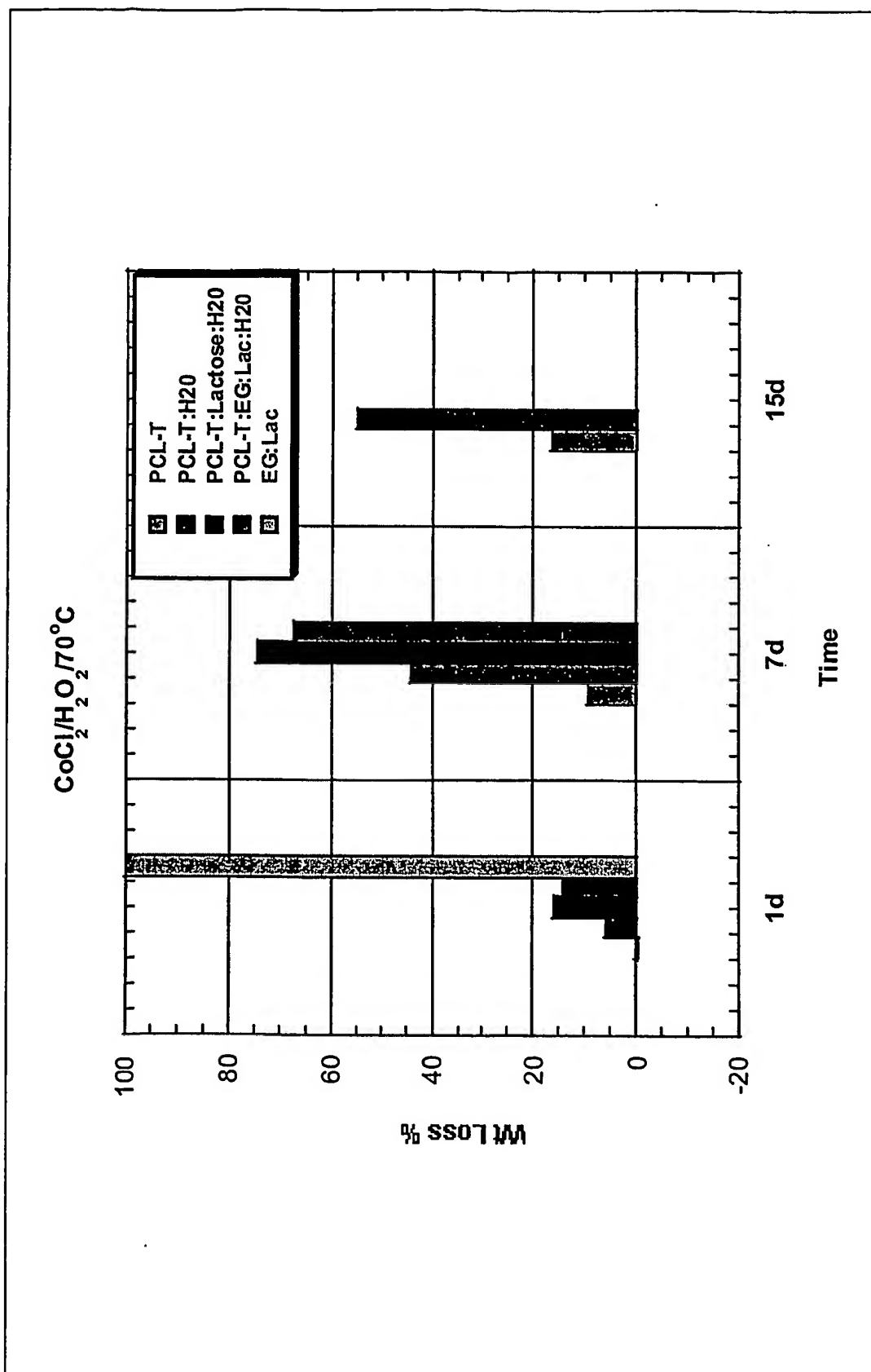


Figure 10

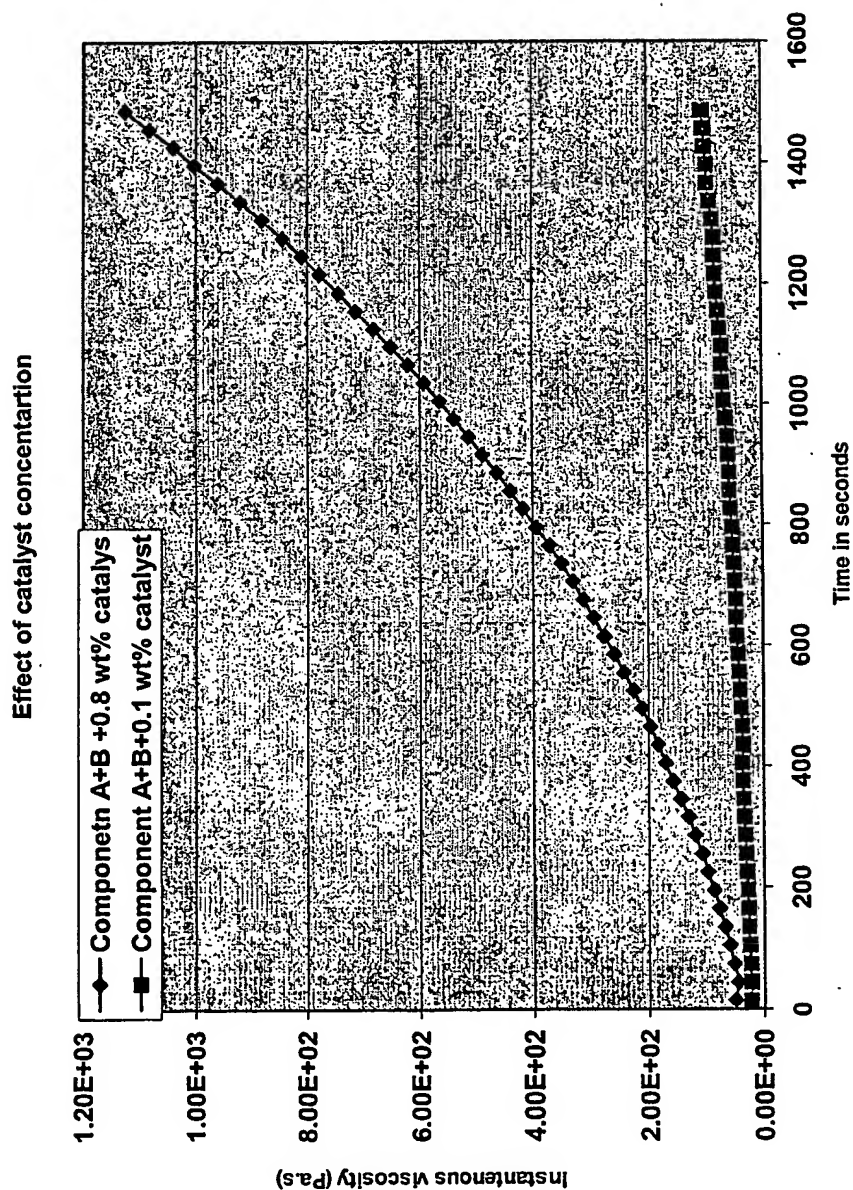
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Figure 11

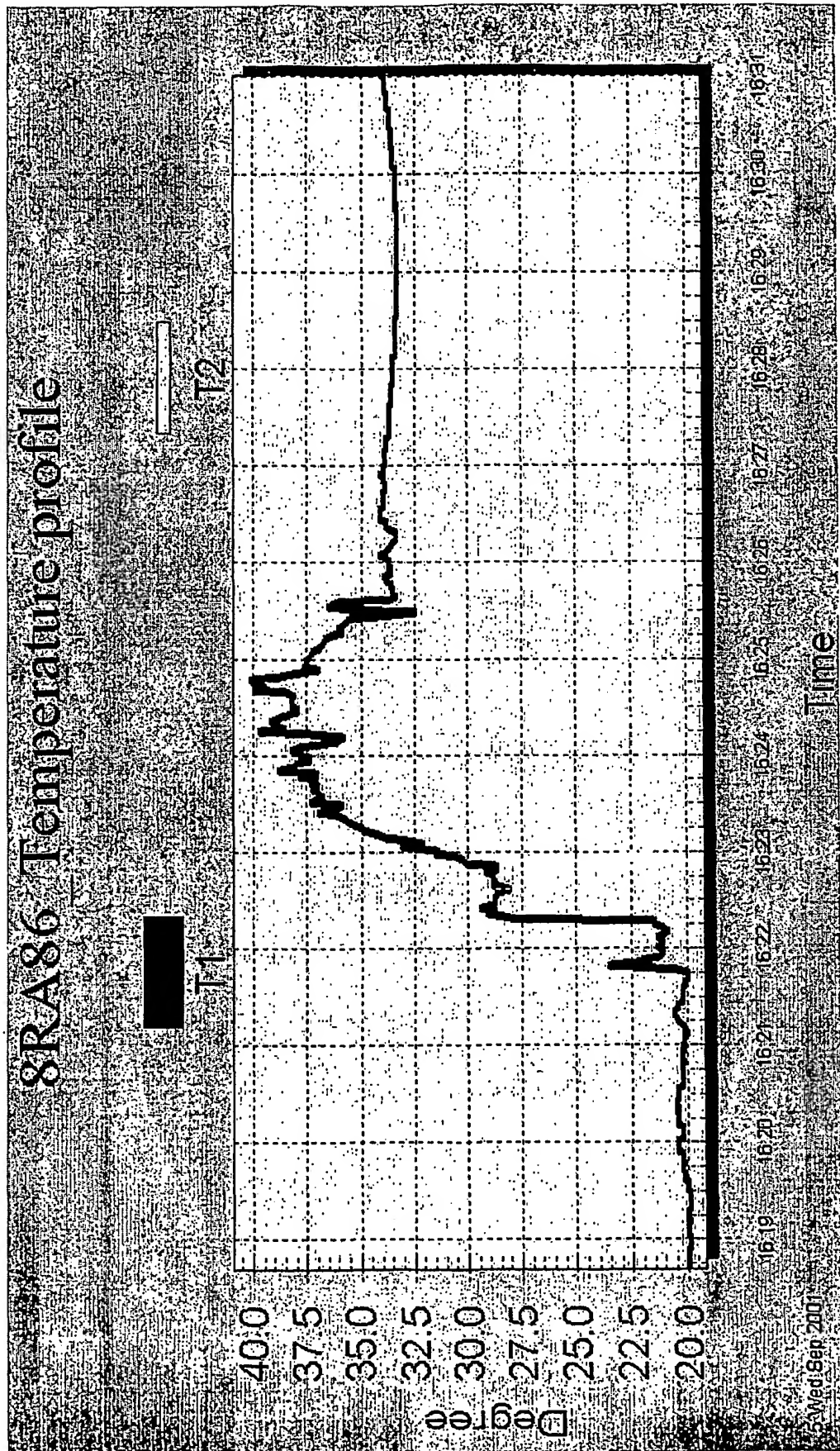
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Figure 12: Change in polymer viscosity with curing time at 23°C



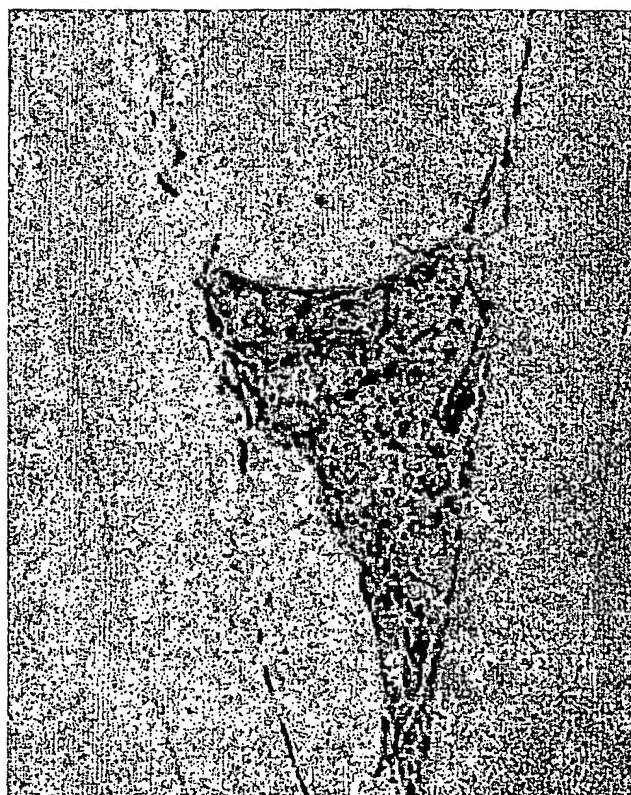
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Figure 13. Temperature rise during polymer curing/gelling



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Figure 14. Haematoxylin & Eosin staining of a 6 week culture showing cluster of viable stem cells (purple) and new matrix (pink) within hollow fibres (transparent) within the polymer scaffold.



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Figure 15. 6 week culture of human mesenchymal stem cells grown in hollow fibres within the polymer scaffold supplemented with differentiation medium to promote osteoblast differentiation. Sample is stained with von Kossa to show bone mineralisation (brown/black staining).



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Figure 16. Haematoxylin & Eosin staining of a 4 week culture showing cluster of viable chondrocytes within resorbed gelatin beads within the polymer scaffold.



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Figure 17. Alcian blue staining of a 9 week culture showing cluster of viable chondrocytes around gelatin beads within the polymer scaffold. Pink staining indicates cells and blue around cells indicates new glycosaminoglycan synthesis .



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Figure 18: Micrographs showing cellular integration in to the polymer structure after 2-month implantation in rats (a) Polymer implant sample # 1 (b) Polymer implant sample #2.



(a) Implant Sample # 1



Implant sample # 2

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